Overview

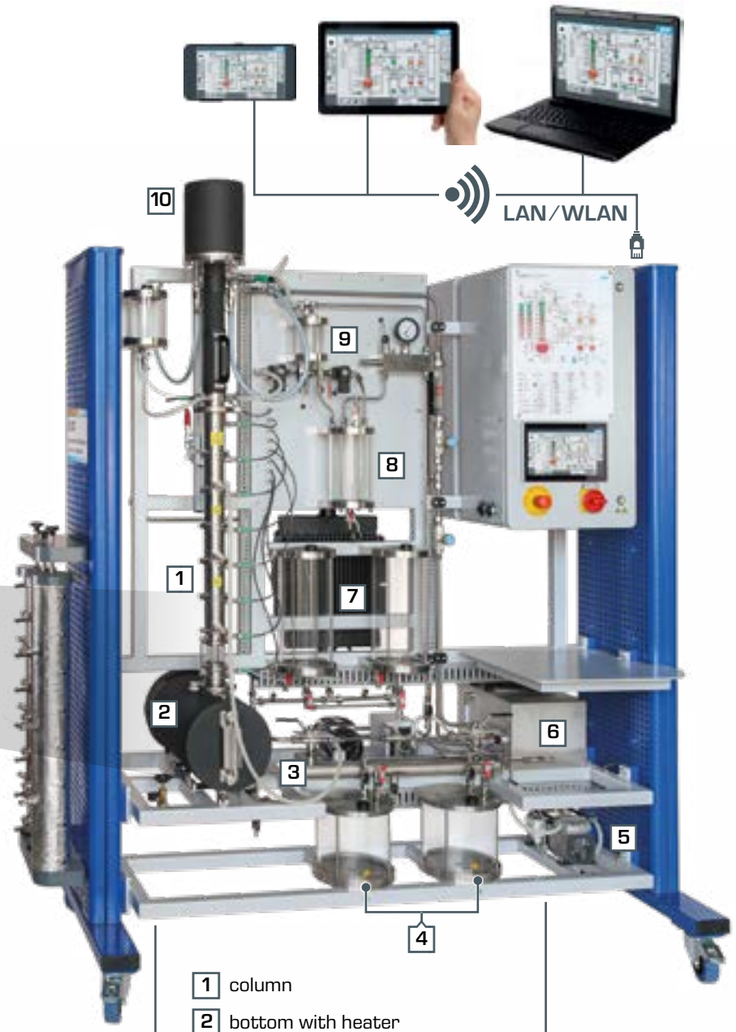
CE 600 Continuous rectification

Liquid mixtures consisting of individual liquids that are soluble in each other can be separated by thermal processes such as distillation. Rectification is an energy-optimised distillation carried out several times in succession.

CE 600 represents continuous rectification on a laboratory scale. Three different types of columns are available for the experiments:

- bubble cap tray column
- sieve tray column
- packed column

The bubble cap tray column and sieve tray column each have eight trays. The liquid mixture to be separated can be fed into the columns at three different heights. The feed can be preheated by means of a heat exchanger.



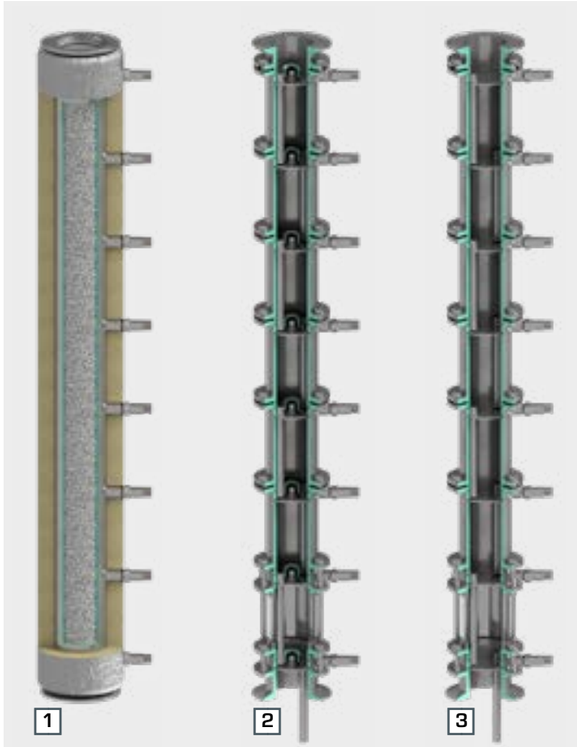
1 column
2 bottom with heater
3 heat exchanger
4 bottom product tank
5 diaphragm pump
6 water tank for cooling water circuit
7 feed tank
8 top product tank
9 phase separation tank
10 top product condenser

Learning objectives

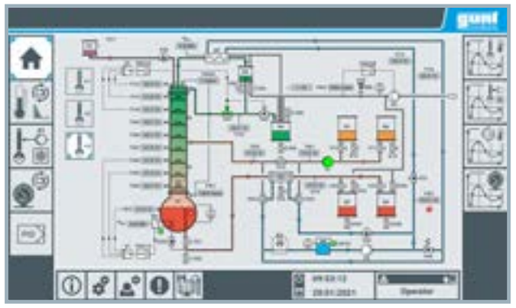
- investigation and comparison of sieve tray, bubble cap tray and packed columns
  - in continuous mode
  - in discontinuous mode
  - in vacuum mode
  - with different inlet heights for the feed flow
  - with different numbers of trays (sieve tray and bubble cap tray column)
- practice-oriented temperature control in the column
  - reflux ratio as actuator for the top of the column
  - heating power as actuator for the column bottom
- determination of temperature profiles
- pressure loss over the column
- energy efficiency increase due to feed preheating

About the product:

www



1 packed column, **2** bubble cap tray column and **3** sieve tray column in sectional view

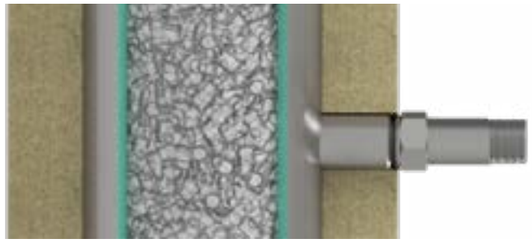


User interface of the touch screen

PLC and software

The system is controlled by an integrated PLC with touch screen. The measured values are displayed on the touch screen and can simultaneously be viewed directly on a PC or mobile end device via LAN. The measured values can be analysed using the GUNT software.

Packed column



A packed column consists of a bed of packing. The packing has a very large surface area, which is used for separation. The liquid phase flows downwards through the packed bed and the gas phase flows upwards. During this process, a mass transfer takes place between the phases.

Bubble cap tray column

Each bubble cap consists of a chimney (riser) into which the gas phase flows from below. The bubble cap located above the chimney diverts the gas phase and allows it to escape near the tray. During operation, the bubble cap is in the liquid phase, meaning that the gas phase rises through the liquid phase as it exits. During this process, a mass transfer takes place between the phases.

Sieve tray column

Each sieve tray consists of three sections: the feed through a pipe from the tray above, the sieve in the middle of the tray and the outlet to the tray below. During operation, the gas phase flows through the sieve from below and rises through the liquid phase. During this process, a mass transfer takes place between the phases.